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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/543,162

07/21/2005

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EXAMINER

MC GINTY, DOUGLAS J

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

08/24/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/543,162	Applicant(s) MATSUI ET AL.	
	Examiner DOUGLAS MC GINTY	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 13-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Prosecution

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 6, 2009 has been entered.

The rejection under 35 USC 112, 2nd paragraph, has been withdrawn.

The Obviousness-type Double Patenting Rejection has been maintained.

The rejection under 35 USC 103 as obvious over Ida (US 7,001,870 or WO 03002483) has been maintained.

The rejection under 35 USC 103 as obvious over Murakami (US 5,521,150) has been maintained.

The text of those sections of the statutes, rules, caselaw, and guidelines not included in this action can be found in a prior Office action.

Double Patenting

Claims 1-7, 18, and 19-21 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. US 7,001,870.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in the patent are directed to a method for producing

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an oxide superconductor by melt processing. The “solder” in the patent claims is a metal compound which is meltable when the precursor is in a partially molten state. The superconductor in the patent claims, “RE123”, is a RE-Ba-Cu-O based oxide. See US 7,001,870, col. 5, lines 33-44. The patent claims also provide that the “solder” contains a rare earth such as Y, etc., as well as Ba and Cu. Claims 8 and 9 in that patent also provide that the “solder” may contain Ag or Pt. The patent claims do not appear to expressly state that the oxide superconductor is produced “by partial melting and solidifying the precursor in said state”, but the patent claims involve melt processing as well.

With respect to present claims 19-21, claims 5-7 in the patent also recites a non-superconductive phase. The “precursor” also would not be superconductive while undergoing the heat treatment.

Claim Rejections - 35 USC § 103

Claims 1-7, 18, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over lida (US 7,001,870 or WO 03002483).¹

The claims of lida have been discussed in the above obviousness-type double patenting rejection.

The lida claims and teachings do not appear to expressly state that the oxide superconductor is produced “by partial melting and solidifying the precursor in said state”.

¹ lida constitutes prior art under 35 USC 102(e) because its US filing date is earlier than the present application and the reference is by another. MPEP 2136.03, 2136.04. Also, please note that lida is equivalent to WO 03/002483 which constitutes prior art under 35 USC 102(b). Citations are made to the US reference in this rejection.

Still, the present claims would have been obvious to one of ordinary skill in the art over the teachings of Iida. The reference is directed to a process of melt processing to produce an oxide superconductor by placing a meltable compound on the superconductor, followed by melting and solidifying the same. The “precursor” also would not be superconductive while undergoing the heat treatment.

With respect to claim 4, Iida teaches the placement of multiple layers of superconductor and substrate on a mount (col. 3, line 57, through col. 4, line 38).

Claims 1-7 and 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (US 5,521,150).

Murakami teaches a method for producing an oxide superconductor with the steps of placing a substrate such as Ag or the compounds of Ba and/or Cu on a superconductor, and heating the structure to the point where the precursor is in a nearly molten state, to produce the oxide superconductor (col. 2, lines 9-23 and 41-54). Cracking is avoided (col. 2, lines 50-55), which one skilled in the art would have recognized as attributable to different thermal coefficients of expansion. The superconductor oxide is based on RE-Ba-Cu-O (Abstract). The reference further teaches an RE-Ba-Cu-O superconductor which is solidified after melt-processing (Fig. 2) with an “adhesive phase”, aka, substrate, that has Ag and oxides of Ba and Cu (Abstract).

Murakami does not appear to teach that the precursor is placed on the substrate. As noted above, however, the reference teaches adding the substrate to the precursor.

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It would have been obvious to turn the structure over to put the precursor on the substrate rather than vice versa. See MPEP 2144.04, IV.C. and VI.A.

With respect to claims 3, 13, and 17, Murakami does not appear to expressly teach that a “portion” of the superconductor does not contain a rare earth element. As discussed above, however, the reference teaches an “adhesive phase” which may contain Ag or oxides of Ba and/or Cu. The adhesive layer would not have been superconductive. Since the rare earth element is not required because other choices were available, it would have been obvious to omit the same. Obviousness only requires a reasonable expectation of success. *In re O’Farrell*, 853 F.2d 894, 904 (Fed. Cir. 1988).

With respect to claim 4, Murakami teaches various mixed oxides of Y, etc., in an intermediate layer, i.e., “interface” (col. 2, line 55, through col. 3, line 20).

With respect to claims 7 and 14, Ag may be present, as discussed above.

With respect to claim 16, Murakami teaches various magnetic field distributions (col. 3, lines 12-17).

With respect to claims 17, 20, and 21, the recitation of a non-superconductive precursor does not appear to distinguish over the reference. Murakami also teaches heat treatment temperatures of 900° to 990°C at col. 2, lines 20 and 21. The heat treatment is deemed to convert the precursor into the superconductor. Compare, pp. 24-28, in particular p. 25, line 17, of the Specification in which overlapping temperature ranges are used to convert the precursor into the superconductor. The “precursor” also would not be superconductive while undergoing the heat treatment.

Response to Arguments

Applicants' arguments filed January 5, 2009, May 6, 2009, and August 6, 2009 have been fully considered and found to be persuasive in part. The 35 USC 112, second paragraph, rejection has been withdrawn but the other rejections have been maintained.

The following discussion addresses the applicants' arguments filed January 5, 2009.

With respect to the Obviousness-type Double Patenting rejection, the applicants argue that the claims of Iida are directed to a method of joining a superconductor with a solder material composed of a superconductor, whereas the present claims are directed to a method of joining a superconductor "precursor" to a metal layer. This argument is not persuasive because the term "precursor" does not distinguish the present claims from those of the patent. New claim 18 indicates that "the mixture of raw materials has the same or a similar composition as a composition of the oxide superconductor." The present claims and the claims of the patent both have heating steps. Iida disclose temperatures of 950° to 1023°C for the heating steps in its examples (col. 10, lines 25-30; and col. 14, lines 26-31). The present specification indicates at p. 25, second paragraph, that the temperature may range from 970° to 1200°C. With the same composition and overlapping heat treatment temperatures, the term "precursor" does not appear to materially distinguish over the claims of Iida.

The applicants urge that the substrate of present claim is not required to be a superconductor, whereas the substrate in the patent claims is. This urging is not

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persuasive because present claims 1-7 do not appear to exclude a superconducting substrate. Also, superconductivity is temperature-dependent. It is noted that the "oxide superconductor" is not superconductive at room temperature, while some metals, alloys, and other compounds are superconductive at lower temperatures.

With respect to the obviousness rejection under 35 USC 103 over Iida, the applicants assert that the reference fails to disclose the use of a superconductor precursor and fails to disclose the preparation of a superconductor from a superconductor precursor. These assertions are not persuasive because the term "precursor" does not materially distinguish over the prior art. As discussed above, present claim 18 provides that the "precursor" may have the same composition as the superconductor oxide and the heat treatments in Iida and the present invention may have overlapping temperatures.

The applicants further assert that there would be no motivation to modify Iida to arrive at the present invention because doing so would change the principle in Iida of joining smaller units of existing superconductor to form a larger superconductor unit. The point remains, however, that the teachings of Iida read on the limitations of the invention as presently claimed. The applicants further note that the present invention can be used to form very large bulk oxide superconductors without cracking, but Iida also teaches that joints can be formed with fewer pores or CuO segregation which lead to large superconductors with uniform crystal orientation (col. 19, lines 3-8).

With respect to the obviousness rejection under 35 USC 103 over Murakami, the applicants argue that the reference teaches joining superconductors while the present

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invention is directed to the joining of a precursor which is thereafter changed into a superconductor. Again, however, the term "precursor" does not appear to distinguish over the prior art. Murakami also teaches heat treatment temperatures of 900° to 990°C at col. 2, lines 20 and 21.

The applicants assert that the thin pieces of the superconductor $\text{Re-Ba}_2\text{Cu}_3\text{O}_{7-\delta}$ in Murakami is distinguishable from the "pure metal or compound which is meltable" in the present claims. This assertion is not persuasive because the reference also teaches the presence of Ag powder and $\text{BaCuO}_2\text{-CuO}$ at col. 2, lines 15-20.

With respect to claim 13, the applicants argue that the thin pieces of $\text{Re-Ba}_2\text{Cu}_3\text{O}_{7-\delta}$ in Murakami are already superconductors prior to the application of heat and pressure. This argument is not persuasive. As noted above, the reference also teaches the presence of Ag powder and $\text{BaCuO}_2\text{-CuO}$.

The applicants further urge that claims 14-16 are not obvious. For the reasons above, however, those claims are found to have been obvious over the teachings of Murakami.

The following discussion addresses the applicants' arguments filed August 6, 2009.

The applicants' August 6, 2009 Remarks has a first section titled "Regarding Superconductivity", followed by arguments on the 35 USC 103(a) rejections over Iida and Murakami, and then followed by arguments on the obviousness-type double patenting (ODP) rejection over the claims of Iida. It should be noted, however, that in both the previous and present Office Actions the ODP rejection has been made first,

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followed by a 35 USC 103(a) rejection over lida and then a 35 USC 103(a) rejection over Murakami. For clarity, therefore, the applicants' arguments are addressed in the order of the rejections set forth above.

With respect to the obviousness-type double patenting rejection, the applicants appear to argue that the lida claims involve the joining of existing superconductor layers as opposed to the presently claimed process of joining precursor superconductor layers. The applicants also appear to argue that the heat treatments in the lida claims pertain to calcination rather than melt processing to induce a phase change. To the extent these arguments are understood, they are not persuasive. The superconductor layers are still "produced by a melt process". lida further discloses that the solder (substrate) is melted and solidified after application to the superconductor planes at temperatures overlapping the temperatures for melting and solidifying the superconductor material (col. 7, lines 15-18 and 27-29). Undergoing further heat treatment after application of the solder (substrate), the superconductor planes still would be considered to be precursors before the heat treatment.

With respect to the 35 USC 103(a) rejection over lida, the applicants assert that lida "is directed to a method for joining existing rare-earth oxide superconductors together using a solder". The applicants further assert that lida does not teach or suggest that a precursor of an oxide superconductor is placed on a substrate material, which contains a pure metal or a compound which is meltable in the precursor when the precursor is partially molten, or that the oxide superconductor is produced by partial melting and solidifying the precursor on the substrate material. These assertions are

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not persuasive. As discussed above, liada teaches overlapping temperatures for melt processing the superconductor material and the solder (substrate) material. lida also teaches that the solder (substrate) material has a lower melting point (Abstract). With those overlapping temperatures, the solder (substrate) material would be "meltable in the precursor when the precursor is partially molten".

With respect to the 35 USC 103(a) rejection over Murakami, the applicants urge that Murakami "is directed to a method of joining existing oxide superconductors via a melting process under pressure". The applicants further urge that Murakami does not teach or suggest that a precursor of an oxide superconductor is placed on a substrate material, which contains a pure metal or a compound which is meltable in the precursor when the precursor is partially molten, or that the oxide superconductor is produced by partial melting and solidifying the precursor on the substrate material. These urgings are not persuasive. As discussed in the previous Office action and repeated above, the superconductor material is melt-processed after the adhesive phase (substrate) is applied. The Ag or BaCuO₂-CuO materials also have lower melting points than the superconductors (col. 2, lines 41-62). With those overlapping temperatures, the adhesive phase (substrate) material would be "meltable in the precursor when the precursor is partially molten".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS MC GINTY whose telephone number is (571)272-1029. The examiner can normally be reached on M-F, 830-500.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOUGLAS MC GINTY/
Primary Examiner, Art Unit 1796